REMARKS

A petition for a further two month extension of time and a Notice of Appeal have today been filed as separate papers and copies are attached hereto.

This "Revised Response" differs from applicants' response filed December 27, 2004 in that it cancels claim 30 and incorporates the limitation of claim 30 into claim 25. It is respectfully submitted that this further amendment serves to place method claims 1-44 in condition for allowance and, further, serves to reduce the issues presented upon appeal.

Toward the bottom of page 3 of the Advisory Action of February 7, 2005, the examiner writes:

> Regarding non-ferrous applications, it is noted that the claims do not recite language limiting the material used.

It is respectfully submitted that the examiner's comments indicate a failure of understanding of applicants' arguments. Applicants' argument was and is to the effect that if one were to use a non-ferrous metal and a lubricant containing water (Praeg et al) in the process of Hosoya et al, the result would not be the invention as claimed because there would be no oxidation. Stated differently, even if a non-ferrous material were to

be used in the process of the present invention and an aqueous coolant as taught by Praeg et al at column 6, lines 1-7 were to be also used in Hosoya, the result would not be applicants' invention because there would be no oxidation and no "removing oxide".

Regarding claim 30, the examiner's brief statement at the bottom of page 4 of the Advisory Action does not really serve to answer applicants' argument. Applicants use an acid, a peroxide or sodium chloride to "enhance the oxidation promoting action." See page 13, line 23 to page 14, line 10 of applicants' specification. Enhancement of the oxidation is totally at odds with providing "wear resistance." Thus, the examiner's explanation of motivation is contrary to applicants' teachings which must be presumed correct absent evidence to the contrary and such contrary evidence is lacking on this record. As the examiner correctly notes, Igrashi et al, at column 2, lines 13-21 teach the addition of certain additives to a base oil of a cutting oil composition of "an effective amount to prevent wear, i.e., provide wear resistance." However, the only additives disclosed by Igrashi et al are different both chemically and functionally from the additives recited by applicants' claim 30. With regard to chemistry, at column 2, lines 14-21 Igrashi et al teach that the additive can be selected from various compounds including certain salts and esters of certain acids. But salts and esters are not acids per se, are not hydrogen peroxide and none disclosed by Igrashi et al is a salt which is the reaction product of a strong acid with a strong base, e.g., sodium chloride.

Functionally, the additives of Igrashi et al differ from those of applicants' claim 30 in that, as noted above, the additives of Igrashi et al serve to prevent wear whereas the additives of applicants' claim 30 serve to enhance wear, specifically enhance oxidation of the tooth surfaces. Accordingly, even if one were to combine the teachings of Igrashi et al with Hosoya and Praeg et al, the result would not be the process as defined by applicants' claim 30 or by applicants' claim 25 amended to include the limitation of claim 30.

The remarks which follow are those previously presented in applicants' response filed December 27, 2004.

The examiner will note that claims 25 and 44 have been amended to incorporate the limitations of claims 49 and 50, respectively, and thereby respectively represent claims 49 and 50 rewritten in independent form.

1. The Objection to the Claims

The objection to claims 26, 27, 43, 49 and 50, to the extent that it remains viable given the present amendments, is respectfully traversed.

The objection to claim 26 is, of course, moot in view of the cancellation of claim 26.

The objection to claim 27, for the reason that, in the view of the examiner, it adds only apparatus limitations to claim 25 is respectfully traversed. Firstly, all claim limitations must be considered in examination. See MPEP 2143.03. Secondly, the relative susceptibility to oxidation as between the gear to be machined and the counter gear is a process factor as is taught at page 12, lines 7-13. As taught there, where the counter gear is more oxidation resistant than the gear to be machined the counter gear can be used as a master gear in repetition of the process.

The objection to claims 49 and 50 as "being of improper dependent form for failing to further limit the subject matter of previous claim" is now moot in view of cancellation of those claims and incorporation of their language into claims 25 and 44.

Finally, the objection to claim 43 is respectfully traversed for the reason that claim 43 clearly refers to and incorporates the method of claim 25. Thus, claim 43 is a product-by-process claim. This type of dependent claim is specifically sanctioned in MPEP 608.01(n)(III) which, in relevant portion reads:

> The fact that the independent and dependent claims are in different statutory classes does not, in itself, render the latter improper. Thus, if

claim 1 recites a specific product, a claim for the method of making the product of claim 1 in a particular manner would be a proper dependent claim since it could not be infringed without infringing claim 1. Similarly, if claim 1 recites a method of making a product, a claim for a product made by the method of claim 1 could be a proper dependent claim. On the other hand, if claim 1 recites a method of making a specified product, a claim to the product set forth in claim 1 would not be a proper dependent claim **> since it is conceivable that the product claim can be infringed without infringing the base method claim if the product can be made by a method other than that recited in the base method claim<. [Emphasis added.]

2. The Rejection of Claims 25-27, 31-33, 35-37 and 43 for Anticipation Or, in the Alternative, Obviousness over Hosoya in View of Praeg et al

In view of the fact that this ground of rejection was not applied to claim 49, the rejection is now moot. As noted above, claim 25 has been amended by incorporation of the limitation of claim 49 and now represents claim 49 rewritten in independent form.

Further, the hypothetical modification of Hosoya would change the essence (operative principle) of Hosoya from a purely mechanical finishing process to a chemical/mechanical process. Given the fact that the secondary reference (Praeg et al) also discloses only a purely mechanical finishing process, the examiner is attempting to conjure something out of a hypothetical combination of references that which is in no way suggested by any of the references.

Insofar as the rejection is based on anticipation, it is respectfully traversed for the reason that Hosoya does not teach use of an aqueous solution or any type of oxidative environment, or oxide removal, which limitations go to the essence of applicants'

invention. The operative principle of applicants' invention is oxidation coupled with mechanical removal of the oxide (product of oxidation). Accordingly, claim 25 calls for the formation of oxide (chemical) and removal (mechanical) of the thus formed oxide. In that the operative principle of applicants' invention involves both oxidation, a chemical reaction, and mechanical removal of the oxide, it is proper to define the method of the present invention as involving "mechano-chemical action". Applicants' specification, for example at page 14, lines 7-10, teaches that the sliding and rolling contact serves to promote the oxidation. Applicants' specification repeatedly refers to the "oxidation promoting action" of the sliding and rolling contact between the gear to be machined and the master gear. Thus, in the present invention, the sliding and rolling contact is mechanical action which both enhances the oxidation and removes the oxide.

In contradistinction, the operative principle of Hosoya is purely mechanical, devoid of chemical action and is preferably grinding, the antithesis of the present invention. See column 3, lines 31-35 and column 5, lines 51-59 of Hosoya et al.

As noted in applicants' previous response, Hosoya specifically teaches away from the operative principle of the present invention, for example at column 7, lines 20 and 21, where Hosoya teaches that an anti-corrosive atmosphere should be employed. Now, in this latest office action, the examiner argues, beginning at the bottom of page 6 and continuing through line 9 at page 7, to the effect that "corrosion" does not necessarily refer to "oxidation." However, oxidation is a type of corrosion. See the definition of "corrosion" at page 315 of Hawley's Condensed Chemical Dictionary,

enclosed herewith. Note the statement in Hawley's dictionary definition which reads: "The rusting of iron is a familiar example of corrosion which is catalyzed by moisture." Accordingly, where Hosoya teaches that corrosion must be avoided that teaching would lead away from any and all corrosive atmospheres including the most common representation thereof, i.e., a moisture-catalyzed oxidative environment. It is respectfully submitted that to change the operative principle of the examiner's primary reference to obtain an effect which that reference seeks to avoid, is the antithesis of obviousness. Neither Hosoya nor Praeg teach <u>any</u> type of chemical finishing. Neither teaches oxidation and neither teaches oxide removal. To accept the examiner's premise that the references are properly combinable to arrive at something (the claimed invention), quite unlike the purely mechanical finishing to which their teachings are limited, requires a leap of faith that transcends hindsight.

Hosoya does not teach or suggest use of a lubricant containing water. Applicants might agree with the examiner in his observation that "water based coolants may be especially useful in non-ferrous applications," however, the use of water-based coolants in non-ferrous applications without corrosion, and therefore without oxidation, is not suggestive of the invention as claimed. The use of water in an oxidative environment, as noted by the definition from Hawley's Dictionary, serves to catalyze the oxidation. As noted above, use of water in an oxidative environment would be contrary to the teachings of Hosoya which seeks to avoid corrosion. Use of water in an oxidative environment to catalyze oxidation, a chemical action, is contrary to the teachings of Hosoya and would serve to completely change the operative principle of

the Hosoya process which is mechanical, specifically grinding. In other words, to change the process of Hosoya to make it based on a chemical effect would essentially emasculate the teachings of Hosoya and could not have been obvious from a reading of Hosoya and/or Praeg et al.

As the examiner correctly notes, Praeg et al at column 6, lines 1-7 teaches the use of water based coolants for the purpose of carrying away the particles removed by the finishing tool. That teaching is not suggestive of the use of water to catalyze an oxidation reaction. Again, the use of water to catalyze an oxidation reaction is contrary to the specific teachings of Hosoya and would serve to completely change the operative principle of Hosoya in a manner in no way envisioned by or suggested by the teachings of either Hosoya or Praeg et al.

At page 3 of the office action the examiner writes: "Regarding the steps of oxidizing the surface, it is noted that oxidation would naturally follow from machining oil having aqueous base which are usually used in the art especially for non-ferrous gears as evidenced by the cited references..." While oxidation might "naturally follow" from the use of machining oil having an aqueous base in the machining of ferrous gears, it would not "naturally follow" in the machining of non-ferrous gears. Without oxidation, there is nothing resembling the present invention in which the operative principle involves oxidation.

Claim 27 further distinguishes the present invention from Hosoya because the differential between materials of the gears, in terms of susceptibility to oxidation, would make no sense in the context of Hosoya which does not utilize oxidation (or oxide removal) in his process but, rather, seeks to avoid an oxidative (corrosive) atmosphere. It is noted that the examiner has not mentioned the limitations of claim 27 and has not stated a *prima facie* case for any ground of rejection thereof.

The office action gives no clue as to where in Hosoya one might find a suggestion of the dual motion, relative movement of the gears as recited by claim 31.

Likewise, it is noted that the examiner has not stated a *prima facie* case for any ground of rejection of claim 32, claim 33, claim 34 or claim 35. No reference of record suggests repeatedly increasing and decreasing distance between axes of the gears as recited by claim 32, and the examiner has not asserted the contrary. No reference of record suggests finishing with the axes of the gears intersecting each other at an approximately right angle (claim 34), with reciprocably tilting (claim 33) or with relative movement of the position of the contact (claim 35).

3. The Rejection of Claims 28, 29, 34 and 38 as Obvious Over Hosoya et al or Hosoya et al in view of Praeg et al

This rejection is respectfully traversed for substantially the same reasons given above. Again, to use an oxidative atmosphere, specifically a water-catalyzed oxidative atmosphere, for the purpose of promoting oxide formation and subsequent removal

thereof is an operative principle involving a chemical action which is in no way suggested by the purely mechanical action involved in the process of Hosoya. Likewise, Praeg et al in no way suggest a water catalyzed oxidative atmosphere for promotion of oxide formation and subsequent removal of the oxide, as a method of finishing gear surfaces. Even if the examiner were correct in the context of a non-ferrous metal, i.e., in the context of a process which would be devoid of oxidation, that hypothetical, a suggestion of which the examiner purports to find in the combined reference teachings, would not be a suggestion of machining by oxidation with oxide removal and would not be a suggestion of the invention as claimed here.

With regard to claim 34, use of gears oriented with their axes "at an approximately right angle" is completely contrary to the strictly parallel orientation employed by the references and cannot properly be characterized as "changing shape" ("shape" of what?) as asserted by the examiner. Further, if, *arguendo,* within the ordinary level of skill in the art, that would not equate to a *prima facie* case of obviousness absent legally sufficient motivation to have made the allegedly obvious modification. *Ex parte Gerlach,* 212 USPQ 471 (PTO Bd. App. 1980).

4. The Rejection of Claim 30 for Obviousness Over Hosoya or Hosoya in View of Praeg et al or Further in View of Igarshi

Claim 30 further distinguishes the present invention from that of Hosoya in that utilization of one of the corrosive agents recited by claim 30 would be contrary to teachings of Hosoya to the effect that a corrosive atmosphere should be avoided. The

examiner's statement that such the use of such corrosive agents would have been motivated by a desire "to provide wear resistance and/or to reduce thermal shock" is totally unsupported, unsupportable, and erroneous in that the corrosive agents would reduce, not enhance, wear resistance.

5. The Rejection of Claim 44 for Obviousness

This rejection is respectfully traversed for the reasons given above in that the essential features of applicants' invention, i.e., use of a water catalyzed oxidizing atmosphere, oxide formation on the surfaces of the gear tooth and subsequent removal of the oxide are in no way suggested by the basic combination of Hosoya and Praeg et al. Accordingly, even if modified in the manner allegedly suggested by Takahashi et al, the result would still not be the present invention.

6. The Rejection of Claims 39-42 for Obviousness

This rejection is also traversed for the reason that the basic combination of Hosoya et al and Praeg et al does not suggest a chemical finishing process of the type claimed here or of any other type. The teachings of McGlasson et al, while perhaps relevant to the further limitations of claims 39-42, lead away from the present invention in that McGlasson et al teach use of an abrasive, i.e., a lapping compound.

7. The Rejection of Claims 45-48 for Obviousness

The rejection of claims 45-48 for obviousness over Hosoya or Hosoya in view of Praeg et al is respectfully traversed. Claim 45 has been amended in the manner of the language of claims 49 and 50 to further define the nature of the counter gear. In contradistinction, the only gear used for machining and described by Hosoya in any detail is the master gear 2 described by Hosoya at column 3, lines 31-35 as having diamond grains electro-deposited onto its toothed surfaces.

Claim 48 serves to further distinguish the apparatus of the present invention from that disclosed by Hosoya, Praeg et al or suggested by any combination thereof. Neither Hosoya nor Praeg et al disclose apparatus which serves to change the position of contract of meshing portions of the counter gear and the gear to be machined.

In conclusion, it is respectfully requested that the examiner reconsider the rejections of record with a view toward allowance of the claims as amended.

Respectfully submitted,

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